

U.S.S.N. 10,788,702

Claim Amendments

Please amend claims 1, 2, 6, and 7 as follows:

Please cancel claims 4, and 11-21 as follows:

Please add new claims 22-33 as follows:

U.S.S.N. 10,788,702

Claims as Amended

1. (currently amended) A chemical mechanical polishing apparatus for polishing a layer on a wafer, comprising:

a base;

a plurality of polishing heads disposed above said base for engaging the wafer and for sequentially transferring said wafer to a respective plurality of polishing stations in a sequential polishing process;

[[a]] said plurality of polishing stations comprising respective polishing pads or belts carried by said base, said polishing stations adjacently arranged for sequentially polishing the layer;

a metrology tool carried by said base and disposed between a pair of adjacent ones of said plurality of polishing pads or belts polishing stations for measuring a thickness of the layer during said sequential polishing process; and

a controller operably connected to said plurality of

U.S.S.N. 10,788,702

polishing ~~pads or belts~~ stations and said metrology tool, said controller operable for operating at least one of said plurality of polishing pads or belts to adjust polishing conditions at said polishing stations responsive to input from said metrology tool.

2. (currently amended) The apparatus of claim 1 wherein said plurality of polishing ~~pads or belts~~ stations comprises a first polishing ~~pad~~ station, a second polishing ~~pad~~ station and a third polishing ~~pad~~ station ~~rotatably carried by said base~~.

3. (original) The apparatus of claim 1 wherein said plurality of polishing heads comprises at least four polishing heads.

4. cancelled

5. (original) The apparatus of claim 1 further comprising a load/unload station carried by said base for loading the wafer on and unloading said wafer from said plurality of polishing heads.

6. (currently amended) The apparatus of claim 2 wherein said metrology tool is interposed between said second polishing ~~pad~~

U.S.S.N. 10,788,702

station and said third polishing ~~pad~~ station.

7. (currently amended) A chemical mechanical polishing apparatus for polishing a layer on a wafer to achieve a target polishing layer thickness, comprising:

a base;

a plurality of polishing heads disposed above said base for engaging the wafer and for sequentially transferring said wafer to a respective plurality of polishing stations in a sequential polishing process;

~~first, second and third polishing pads or belts carried by said base for polishing the layer;~~

said plurality of polishing stations comprising respective polishing pads or belts carried by said base, said polishing stations adjacently arranged for sequentially polishing the layer;

~~a metrology tool carried by said base between said~~

U.S.S.N. 10,788,702

~~first polishing pad and said second polishing pad for measuring a thickness of the layer; and~~

a metrology tool carried by said base and disposed between a pair of adjacent polishing stations for measuring a thickness of the layer during said sequential polishing process;

~~a controller operably connected to said polishing pads or belts and said metrology tool for operating at least one of said second polishing pad or belt and said third polishing pad or belt responsive to input from said metrology tool~~

a controller operably connected to said plurality of polishing stations and said metrology tool, said controller operable to adjust polishing conditions comprising said polishing stations responsive to input from said metrology tool; and,

wherein said controller is further operable to determine and control a remaining polishing time at one or more of said polishing stations comprising a remaining portion of said polishing sequence required to achieve said targeted polishing layer thickness.

U.S.S.N. 10,788,702

8. (original) The apparatus of claim 7 wherein said plurality of polishing heads comprises at least two polishing heads.

9. (original) The apparatus of claim 7 further comprising a load/unload station carried by said base for loading the wafer on and unloading said wafer from said plurality of polishing heads.

10. (original) The apparatus of claim 9 wherein said plurality of polishing heads comprises at least two polishing heads.

Claims 11-21 cancelled

22. (new) The apparatus of claim 1 wherein said controller is further operable to determine and control a remaining polishing time at one or more of said polishing stations comprising a remaining portion of said polishing sequence required to achieve said targeted polishing layer thickness.

24. (new) The apparatus of claim 1 wherein said controller is operable to control polishing conditions at one or more of said polishing stations comprising polishing steps carried out in said sequential polishing process prior to measuring said thickness.

U.S.S.N. 10,788,702

25. (new) The apparatus of claim 1 wherein said polishing conditions are selected from the group consisting of polish time, down force, platen/head rotation speed and slurry flow.

26. (new) The apparatus of claim 1, wherein said plurality of polishing stations comprises three polishing stations and three respective polishing pads or belts for carrying out three respective polishing steps.

27. (new) The apparatus of claim 26, wherein said metrology tool is disposed between the first and second polishing stations for measuring a thickness following the first polishing step.

28. (new) The apparatus of claim 26, wherein said metrology tool is disposed between the second and third polishing stations for measuring a thickness following the second polishing step.

29. (new) The apparatus of claim 7 wherein said controller is operable to control polishing conditions at one or more of said polishing stations comprising polishing steps carried out in said sequential polishing process prior to measuring said thickness.

U.S.S.N. 10,788,702

30. (new) The apparatus of claim 7 wherein said polishing conditions are selected from the group consisting of polish time, down force, platen/head rotation speed and slurry flow.

31. (new) A chemical mechanical polishing apparatus for sequentially polishing and measuring a thickness of a partially polished layer on a wafer to achieve a target polishing layer thickness, comprising:

a plurality of polishing heads for engaging the wafer and for sequentially transferring said wafer to a respective plurality of polishing stations in a sequential polishing process;

said plurality of polishing stations comprising respective polishing pads or belts, said polishing stations adjacently arranged for sequentially polishing the layer;

a metrology tool carried disposed between a pair of adjacent polishing stations for measuring a thickness of the layer during said sequential polishing process;

U.S.S.N. 10,788,702

a controller operably connected to said plurality of polishing stations and said metrology tool, said controller operable to determine and control a remaining polishing time at one or more of said polishing stations comprising a remaining portion of said polishing sequence required to achieve said targeted polishing layer thickness in response to input from said metrology tool.

32. (new) The apparatus of claim 31, wherein said controller is further operable adjust polish conditions comprising said plurality of stations in response to input from said metrology tool.

33. (new) The apparatus of claim 32 wherein said polishing conditions are selected from the group consisting of polish time, down force, platen/head rotation speed and slurry flow.